STANDARD FORM NO. 64 CONFIDENTIAL

Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files - RD-107, Task Order 10 DATE: 30 December 1959

FROM : [redacted] 25X1

SUBJECT: Trip Report - RT-21 Transmitter 25X1

1. On 10 December 1959 a visit was made to [redacted] 25X1 to monitor progress made in developing the RT-21 transmitter. Persons present for discussions were:

[redacted] 25X1

2. All sections of the RT-21 transmitter have been completely breadboarded and tested and all that now remains is the integration of these sections, plus construction. [redacted] stated that the 25X1 RT-21 transmitter will use two each 2N1337 transistors in parallel as a final amplifier stage and will be capable of delivering 2 watts of RF power into the matching network. To protect the final amplifier transistors from burning out while antenna tuning and matching is underway, the bias of these transistors will be controlled such that the input driving power will be limited during tuning by the action of a voltage control network.

3. Antenna Matching Network - The total time required for the antenna matching network to be first repositioned and then tuned for proper operation will be approximately 3 minutes. This time cannot be shortened because of the manner and direction of physically tuning the inductance of the matching network. Pre-positioning causes the inductance to move to one end of the coil, and tuning tunes in the opposite direction along the coil until a tune state exists; the higher the frequency the longer the tuning required. If this time is decreased by increasing the speed of rotation of the inductance and capacitor mechanical oscillations in tuning will occur near the resonate point. This is caused from the capacitor over-shoot in tuning.

4. During the pre-position phase of tuning of the matching network [redacted] was told to be sure that no RF radiations would be allowed. 25X1 During the actual tuning phase, RF will be radiated from the antenna since the phase and magnitude detecting circuits require a sample of the RF signal to effect proper tuning.

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5. The RT-21 consists of the following stages with the number of transistors numerated for each stage as follows:

Oscillator and Sweep Circuit	4 transistors
Driving Circuit	1 transistor
Output Amplifier Stage	2 transistors
Phase and Magnitude Sensing Circuits	4 transistors
Voltage Control Circuit	3 transistors
400 Cycle Power Supply	2 transistors
Servo Amplifier	4 transistors
Voltage Regulator	2 transistors
DC-to-DC Converter	3 transistors

6. Every attempt is being made to minimize the number of controls that will require manipulation by the operator. At present all the operator need do to place the RT-21 into operation is connect the power supply and antenna, change the bandswitch, and install the crystal into its holder. The pre-positioned control may be undertaken automatically through a switch located directly underneath the crystal holder and actuated by the insertion of the crystal. This switch may also be used to prevent RF from being radiated during pre-positioning. Another possible means of providing a pre-positioning action may be through the connection of the power cord to the transmitter. This is as yet not firmed up and is now being considered by [redacted] 25X1 to insure that nothing is overlooked.

7. The next thing discussed was the receive/transmit function that is to be incorporated in this transmitter, and the type of key that will be enclosed. The writer stated that this Agency had a miniature key, and if available would be supplied to [redacted] Further, 25X1 that a miniature receive/transmit relay might also be available.

8. [redacted] stated that the RT-21 would be ready for delivery 25X1 approximately the middle of April 1960. He was informed by the writer that the contract expired in February 1960 and that it was believed that the transmitter would have been ready by that time. Because of the trouble encountered in the mechanical oscillations of the antenna matching network, the contractor has lost considerable time. Previous to this trouble the work on the RT-21 was approximately 1½ months ahead of schedule. Further, [redacted] stated that his section was not 25X1 authorized to begin the RT-21 program until 8 September 1958. This delay was due to problems arising with regards to the type of reports to be submitted under this contract, and approximately two months were taken to clarify the situation. Originally, the contract is dated 15 June 1958 and was to run for a period of 20 months. [redacted] section 25X1

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received their work order on 8 September 1958 and the contract was considered to run for a period of 20 months from that date, which makes the ending date around 15 April 1960. [redacted] was requested to submit a request for additional time to cover that period of delay. 25X1

[redacted] 25X1

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